SUPPLEMENTAL MATERIAL

Lack of Association of Antihypertensive Drugs with the Risk and Severity of COVID-19: A Meta-Analysis

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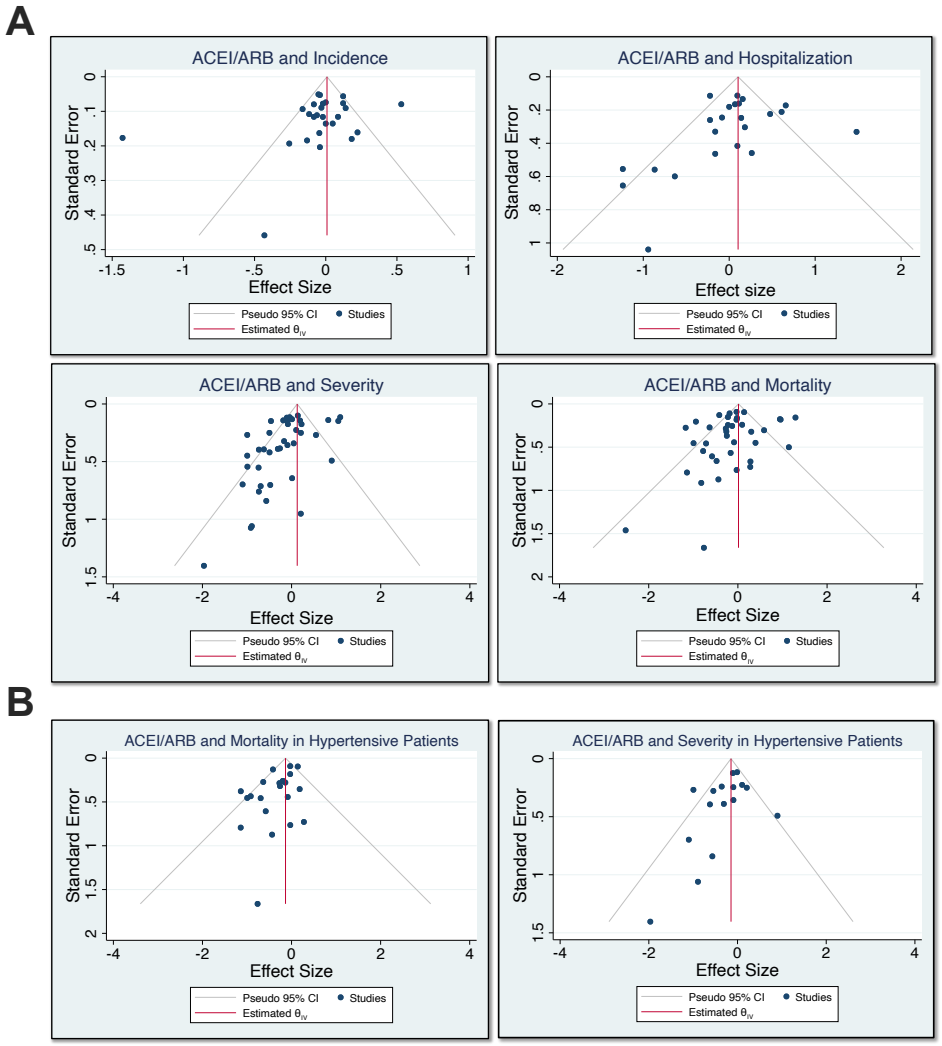
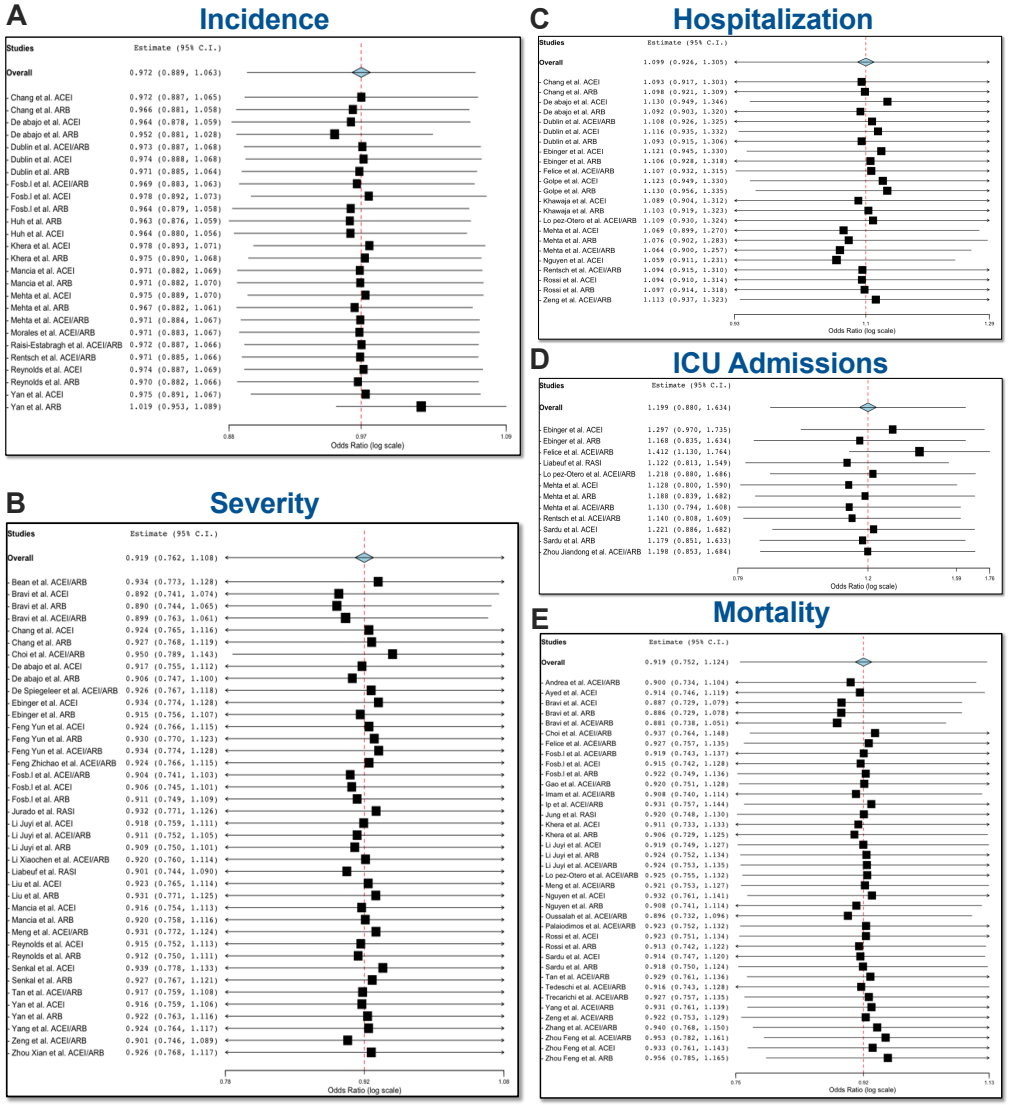
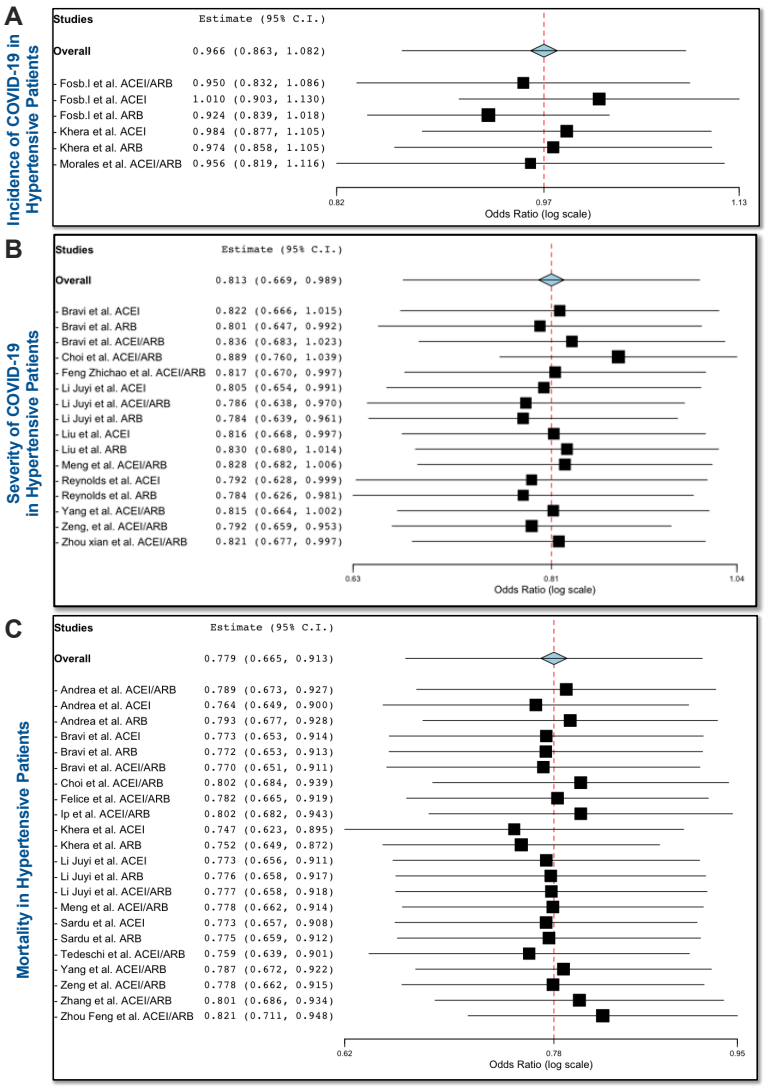
Supplementary Figures and Tables



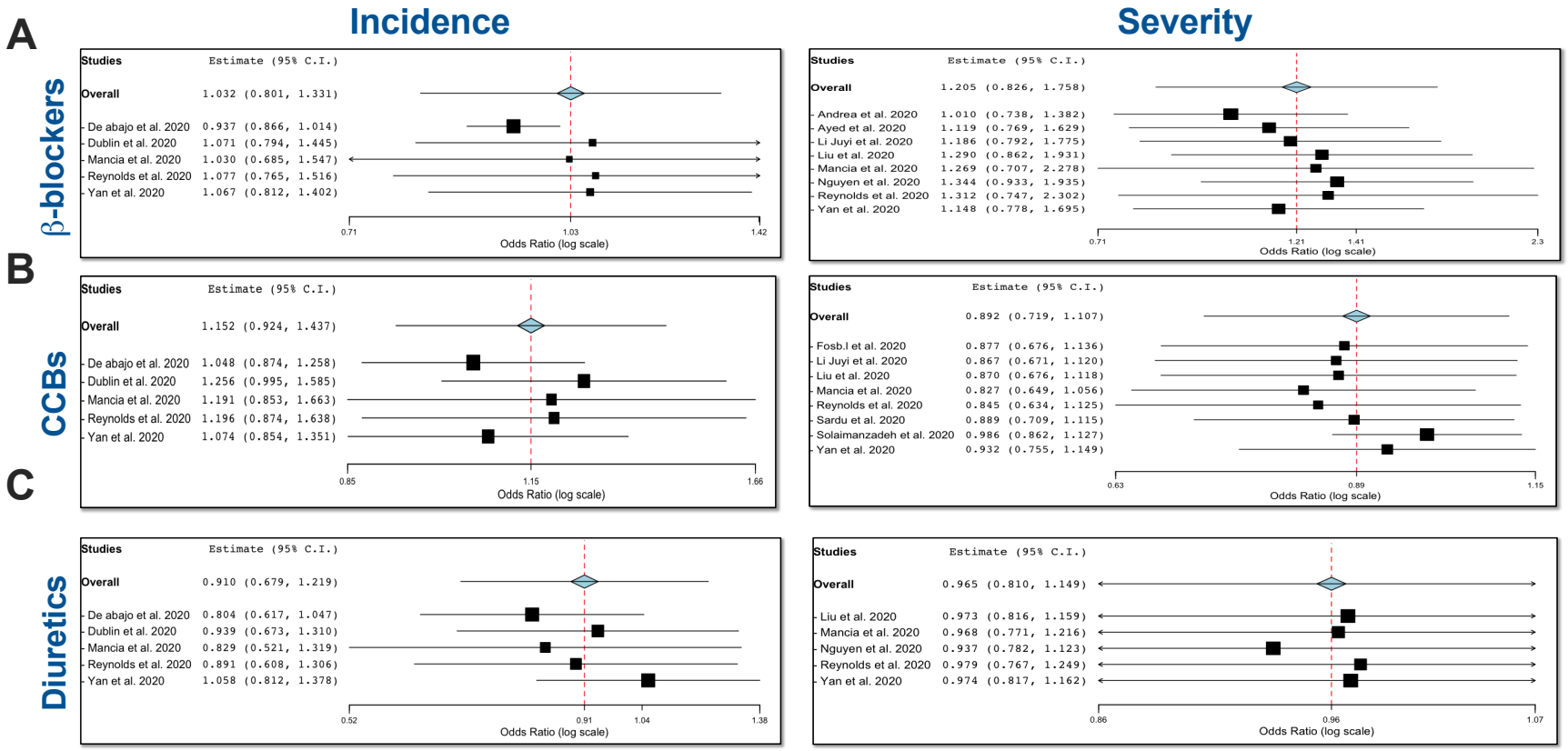
Online Figure 1. Funnel plots showing publication bias for **A)** ACEIs/ARBs with respect to incidence, severity, hospitalization, and mortality. **B)** Funnel plots showing publication bias for ACEIs/ARBs with respect to severity and mortality in hypertensive patients.



Online Figure 2. Leave-one-out-meta-analysis of prior usage of ACEIs/ARBs with respect to **A**) incidence, **B**) severity, **C**) hospitalization, **D**) ICU admissions, and **E**) mortality.



Online Figure 3. Leave-one-out-meta-analysis of prior usage of ACEIs/ARBs with respect **to A) incidence, B) severity and C) mortality.**



Online Figure 4. Leave-one-out-meta-analysis of prior usage of **A**) β-blockers, **B**) CCBs, and **C**) diuretics on incidence and severity of COVID-19.

Online Table 1. NOS for Assessment of Quality of Included Studies: Cohort Studies

	Selection				Comparability		Outcomes	
Study	Representativeness of exposed cohort?	Selection of the nonexposed cohort?	Ascertainment of exposure?	Demonstration that outcome of interest was not represent at the start of the study	Comparability of Cohort	Assessment of outcome	Was follow-up long enough for outcomes to occur	Adequacy of follow up of cohorts
Andrea et al.	★	★	★		★	★	★	
Ayed et al.	★	★	★		★	★	★	
Bean et al.	★	★	★	★	★	★	★	★
De Spiegeleer et al.		★	★	★	★	★	★	★
Dublin et al.	★	★	★	★	★	★	★	★
Felice et al.	★	★	★		★	★	★	
Feng Zhichao et al.	★	★	★	★	★	★		★
Fosbøl et al.	★	★	★		★	★	★	
Gao et al.	★	★	★		★	★	★	★
Golpe et al.	★	★	★		★	★	★	
Imam et al.	★	★	★		★	★	★	
Jung et al.	★		★	★	★		★	★
Khawaja et al.	★	★		★	★	★	★	
Khera et al.	★	★	★	★	★	★	★	★
Li Xiaochen et al.	★	★	★		★		★	★
Liabeuf et al.	★	★	★		★	★	★	
Liu et al.	★	★	★	★	★		★	★
Lo´pez-Otero et al.	★	★	★		★	★	★	
Mehta et al.	★	★	★	★			★	★
Meng et al.	★	★	★	★	★		★	★
Morales et al.	★		★		★	★	★	★
Nguyen et al.	★	★	★		★	★	★	★
Oussalah et al.	★	★	★		★	★	★	
Palaiodimos et al.	★	★	★	★	★	★	★	★
Raisi-Estabragh et al.	★	★	★	★	★		★	
Regina et al.	★	★	★	★	★		★	★
Rentsch et al.	★	★	★	★	★		★	★

Reynolds et al.	★	★	★		★		★	
Rossi et al.	★	★	★	★	★	★	★	
Sardu et al.	★	★	★	★	★	★		
Şenkal et al.	★	★	★		★	★	★	★
Tan et al.	★	★	★				★	★
Tedeschi et al.		★	★	★			★	★
Trecarichi et al.		★	★		★	★	★	
Yang et al.		★	★	★			★	★
Zeng et al.		★	★	★		★	★	★
Zhang et al.	★	★	★	★	★	★	★	★
Zhou Feng et al.	★	★	★		★	★	★	
Zhou Jiandong et al.	★	★			★	★	★	★
Zhou Xian et al.	★	★	★	★	★	★	★	★

Online Table 2. NOS for Assessment of Quality of Included Studies: Case-Control Studies

	Selection				Comparability		Exposure		
Study	Is the case definition adequate	Representative-ness of cases	Selection of controls	Definition of controls	Study controls for age/sex	Study controls for at least 3 additional factors	Ascertainment of exposure	Same method of ascertainment of exposure	Nonresponse rate
Bravi et al.	★	★	★	★	★	★	★	★	★
Chang et al.	★	★	★	★	★	★	★	★	★
Choi et al.	★	★	★	★	★	★	★	★	★
De Abajo et al.	★	★	★	★	★	★	★	★	★
Ebinger et al.	★		★		★	★	★	★	
Fosbøl et al.	★	★	★	★	★	★	★	★	
Huh et al.	★	★	★	★	★		★	★	★
Ip et al.	★	★	★	★			★	★	
Jurado et al.	★	★	★	★	★		★	★	★
Li Juyi et al.	★	★	★	★	★		★	★	★
Mancia et al.	★	★	★	★	★	★	★	★	★
Solaimanzadeh et al.	★	★	★	★			★	★	
Yan et al.	★	★	★	★	★	★	★	★	★
Feng Yun et al.	★	★	★	★	★		★	★	★

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	2
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	3, 4
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	4
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	3, 4
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	3, 4
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	4
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	3, 4
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	4
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	4
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	4, 5

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	4
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	4, 5
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	5
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	5, 13
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	6
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	5-7
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	5-7
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	7
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	7
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	7
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	7, 8
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	8
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	9

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

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